

Name: Answers / Solutions

1. Write the graphed number set in both **inequality** and **interval** notation.

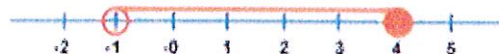
Inequality Notation: $x \geq 1$



Interval Notation: $[1, \infty)$

2. Write the graphed number set in both **inequality** and **interval** notation.

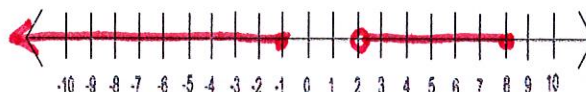
Inequality Notation: $-1 < x \leq 4$



Interval Notation: $(-1, 4]$

3. Graph the set of numbers $(-\infty, -1] \cup (2, 8]$ and write the set in inequality notation:

$x \leq -1$ or $2 < x \leq 8$



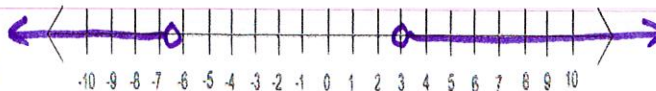
4. Solve the inequality $17 + 2x \leq 7 - 3x$ and graph the solution set.

$$\begin{aligned} 17 + 2x &\leq 7 - 3x \\ +3x &+3x \\ 17 + 5x &\leq 7 \\ -17 &-17 \\ 5x &\leq -10 \\ \frac{5x}{5} &\leq \frac{-10}{5} \\ x &\leq -2 \end{aligned}$$



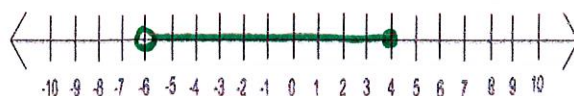
5. Solve the set of inequalities $5 + 2x < -8$ or $4 - x < 1$ and graph the solution set.

$$\begin{aligned} 5 + 2x &< -8 & \text{or} & & 4 - x &< 1 \\ -5 &-5 & & & -4 &-4 \\ 2x &< -13 & & & -x &< -3 \\ \frac{2x}{2} &< \frac{-13}{2} & & & -1(-x < -3) & \\ x &< -6\frac{1}{2} & & & x &> 3 \end{aligned}$$



6. Solve the inequality $5 < \frac{1}{2}x + 8 \leq 10$ and graph the solution set.

$$\begin{aligned} & -8 \quad -8 \quad -8 \\ & -3 < \frac{1}{2}x \leq 2 \\ & 2(-3 < \frac{1}{2}x \leq 2) \\ & -6 < x \leq 4 \end{aligned}$$



7. Determine the slope and y-intercept of the line with equation $4x - 3y = 15$

$$\begin{aligned} 4x - 3y &= 15 \\ -4x & \quad -4x \\ -3y &= -4x + 15 \\ -3y &= -4x + 15 \\ \frac{-3y}{-3} &= \frac{-4x}{-3} + \frac{15}{-3} \\ y &= \frac{4}{3}x - 5 \end{aligned}$$

$$\begin{aligned} \text{slope } m &= \frac{4}{3} \\ \text{y-intercept} &= (0, -5) \end{aligned}$$

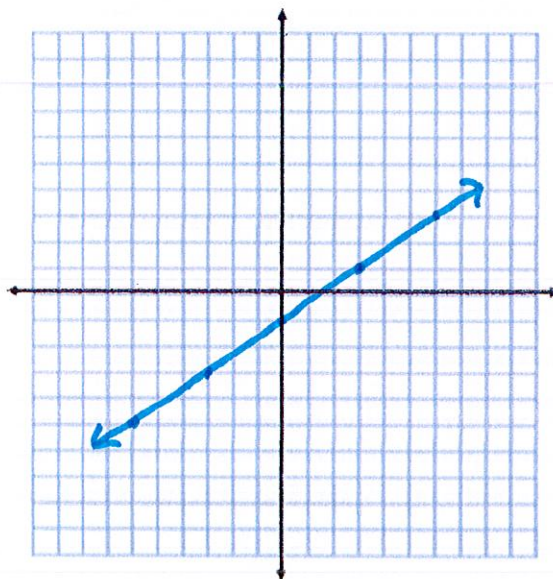
8. Graph the line with points $(3, 1)$ & $(-6, -5)$, and determine an equation of the line.

$$m = \frac{-5 - 1}{-6 - 3} = \frac{-6}{-9} = \frac{2}{3}$$

$$y - 1 = \frac{2}{3}(x - 3)$$

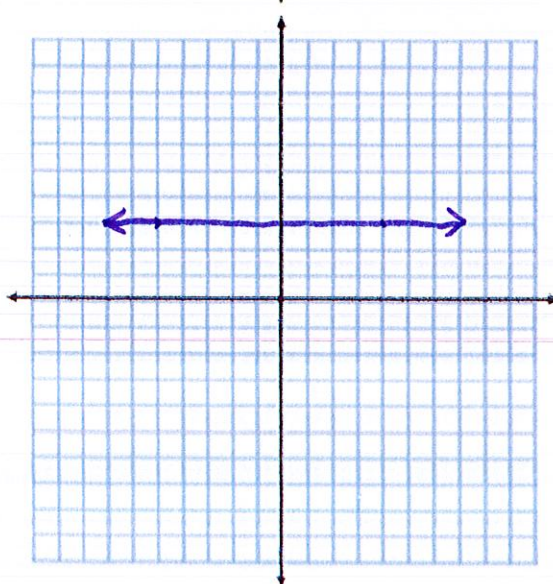
$$y + 1 = \frac{2}{3}x - 2 + 1$$

$$y = \frac{2}{3}x - 1$$



9. Graph the line with points $(-5, 3)$ & $(4, 3)$, and determine an equation of the line.

$$y = 3 \quad \text{slope } m = 0$$

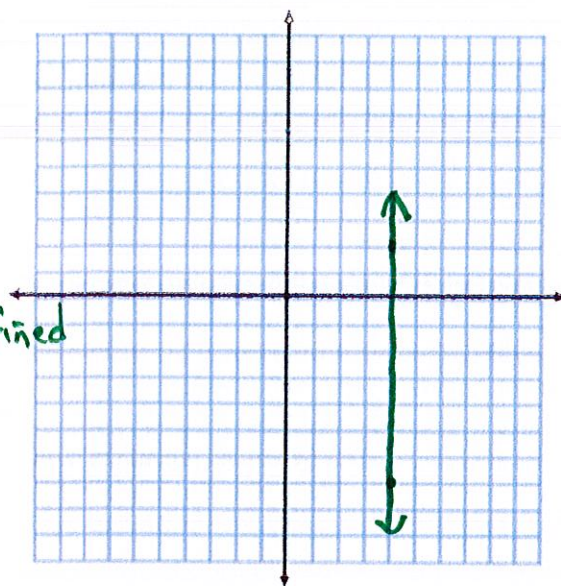


10. Graph the line with points $(4, -7)$ & $(4, 2)$, and determine an equation of the line.

$$x = 4$$

slope is undefined

$$m = \frac{2 - (-7)}{4 - 4} = \frac{9}{0} = \text{undefined}$$

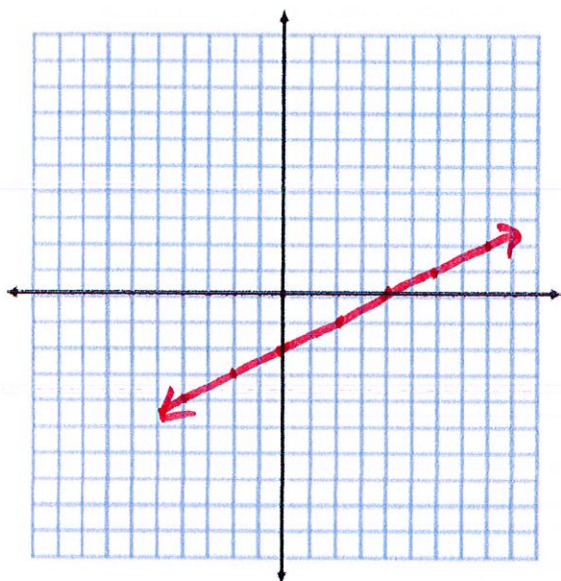


11. Graph $2x - 4y = 8$ (plot several points and draw your line neatly)

If $x = 0$ $2(0) - 4y = 8$ $y = -2$
 $(0, -2)$

If $y = 0$ $2x - 4(0) = 8$ $x = 4$
 $(4, 0)$

$$m = \frac{0 - (-2)}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$

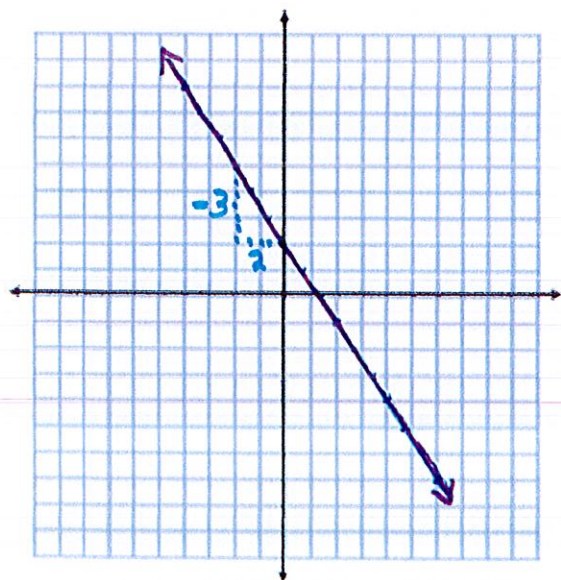


12. Given the line shown, write an equation in slope-intercept form $y = mx + b$ first, then convert the equation to standard form $Ax + By = C$

$$y = -\frac{3}{2}x + 2$$

$$2y = -3x + 4$$

$$3x + 2y = 4$$



13. Given a line containing the points $(-3, 5)$ and $(9, 1)$, find an equation of the line in point-slope form first, then convert the equation to slope-intercept form.

$$m = \frac{1-5}{9-(-3)} = \frac{-4}{12} = -\frac{1}{3}$$

Using $(9, 1)$ $y - 1 = -\frac{1}{3}(x - 9)$

$$y - 1 = -\frac{1}{3}x + 3$$

$$y = -\frac{1}{3}x + 4$$

14. The two given equations represent lines. Are the lines parallel or Perpendicular or neither? Explain briefly why. $3x - 4y = -4$ & $-6x + 8y = -24$

$$3x - 4y = -4$$

$$-4y = -3x - 4$$

$$y = \frac{3}{4}x + 1$$

$$-6x + 8y = -24$$

$$8y = 6x - 24$$

$$y = \frac{6}{8}x - \frac{24}{8}$$

$$y = \frac{3}{4}x - 3$$

The lines are parallel since they have the same slope and different y-intercepts

15. Line A has equation $y - 7 = \frac{3}{2}(x + 1)$. Line B contains the point $(8, -5)$ and is parallel to line A. Determine an equation for line B in any form you choose.

Slope of line B is also $m = \frac{3}{2}$

$$y - 5 = \frac{3}{2}(x - 8)$$

$$y + 5 = \frac{3}{2}(x - 8) \checkmark$$

$$y + 5 = \frac{3}{2}x - 12$$

$$y = \frac{3}{2}x - 17 \checkmark$$

$$y = \frac{3}{2}x - 17$$

$$2y = 3x - 34$$

$$-3x + 2y = -34 \checkmark$$

16. Line A has equation $x - 3y = 15$. Line B contains the point $(-6, 4)$ and is parallel to line A. Determine an equation for line B in any form you choose.

$$x - 3y = 15$$

$$-3y = -x + 15$$

$$y = \frac{-x}{-3} + \frac{15}{-3}$$

$$y = \frac{1}{3}x - 5$$

The slope of line B is also $m = \frac{1}{3}$

$$y - 4 = \frac{1}{3}(x - (-6))$$

$$y - 4 = \frac{1}{3}(x + 6) \checkmark$$

$$y - 4 = \frac{1}{3}x + 2$$

$$y = \frac{1}{3}x + 6 \checkmark$$

$$3y = x + 18$$

$$-x + 3y = 18 \checkmark$$